

Claims

[c1] What is claimed is:

1. In a two-dimensional photonic crystal configured by an arrangement, in a two-dimensional lattice of points defined in a slab, of low-refractive-index substances having a small refractive index relative to the slab and being of identical dimension and shape, a cavity made from a point defect within the two-dimensional photonic crystal, wherein:

said point defect contains among said lattice points a plurality of three or more neighboring one another, and in said plurality of three or more lattice points said low-refractive-index substances are missing from said arrangement; and

in said arrangement at least one of said low-refractive-index substances that would otherwise be arranged to correspond to at least one among those of said lattice points being nearest said point defect is displaced by a predetermined distance from said at least one of said lattice points nearest said point defect.

[c2] 2. A cavity as set forth in claim 1, wherein in said arrangement at least one of said low-refractive-index sub-

stances that would otherwise be arranged to correspond to at least one among those of said lattice points being secondarily adjacent said point defect is displaced by a predetermined amount from said at least one of said lattice points secondarily adjacent said point defect.

- [c3] 3. A cavity as set forth in claim 1, wherein said point defect contains six or fewer of said lattice points.
- [c4] 4. A cavity as set forth in any of claims 1, wherein the wavelength of light that resonates in said cavity is adjustable in dependency upon the dimension and shape of said point defect.
- [c5] 5. A cavity as set forth in any of claims 1, wherein said point defect contains said plurality of lattice points in a form in which said plurality is lined in a line segment.
- [c6] 6. A cavity as set forth in any of claims 1, wherein said low-refractive-index substances are filled into columns perforating said slab.
- [c7] 7. A cavity as set forth in any of claims 1, wherein the points in said two-dimensional lattice are arrayed in a triangular lattice.
- [c8] 8. A cavity as set forth in any of claims 1, wherein said slab has a refractive index of 2.0 or greater.

- [c9] 9. A cavity as set forth in any of claims 1, wherein said low-refractive-index substances are air.
- [c10] 10. In a two-dimensional photonic crystal, a channel add/drop filter comprising:
at least one waveguide made from a line defect within said two-dimensional photonic crystal; and
at least one cavity as set forth in any of claims 1, said cavity being disposed adjacent said waveguide, within a separation in which an electromagnetically reciprocal effect is produced between said cavity and said waveguide.
- [c11] 11. A channel add/drop filter as set forth in claim 10, comprising a plurality of said cavities, wherein said cavities differ from one another in resonant frequency.